REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-27 and 29-32 are pending in this application. Claims 1-5 and 17 are amended by the present amendment. Claims 1-5 and 17 are amended to correct minor informalities noted in the outstanding Official Action. No new matter is presented.

In the outstanding Office Action, Claims 1-4 and 17 were objected to because of minor informalities; Claims 1-27 and 29-32 were rejected to under 35 U.S.C. § 112, second paragraph; Claims 1-3, 5, 11-27 and 29-32 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jorgensen (U.S. Patent No. 6,720,984, herein "Jorgensen") in view of Kiraly et al. (U.S. Patent 6,249,606, herein "Kiraly"); and Claims 4 and 6-10 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants appreciatively acknowledge the indication of allowable subject matter. However, since Applicants consider that independent Claim 1 is patentable over the applied reference, dependent Claims 4 and 6-10 are presently maintained in dependent form.

Claims 1-4 and 17 were objected to because of minor informalities. In response, these claims are amended as recommended in the outstanding Official Action. Accordingly, Applicants respectfully request that the objections to these claims be withdrawn.

Claims 1-27 and 29-32 were rejected to under 35 U.S.C. § 112, second paragraph, as indefinite. Particularly, regarding Claims 1, 2 and 27, the Official Action notes that the use of the character/term "S" to represent both the signature and the vector forming the signature is "confusing." However, Claim 1 recites "a vector (S)" and "the resultant vector forming the signature (S)." Thus, the vector (S) and the resultant vector forming the signature (S) are the same component, and are therefore identified using the same character/term. Therefore, Applicants respectfully submit that Claims 1, 2 and 27 are definite.

In response to the rejection of Claim 5 under 35 U.S.C. § 112, second paragraph, the reference term "Gk" is removed from this claim, thereby rendering this rejection moot.

Accordingly, Applicants respectfully request that the rejection of Claims 1-27 and 29-32 were rejected to under 35 U.S.C. § 112, second paragraph, be withdrawn.

Claims 1-3, 5, 11-27 and 29-32 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jorgensen in view of Kiraly. Applicants respectfully traverse this rejection, as independent Claims 1 and 27 recite novel features clearly not taught or rendered obvious by the applied references.

Independent Claim 1 relates to a method of obtaining a signature (S) of a gesture (G) produced in free space, by deriving at least one time-evolving signal (14) representative of muscular activity involved in producing the gesture and determining at least one value of a parameter (Psfi) yielded by that signal. Claim 1 recites that the method comprises the steps of

> - time dividing the time-evolving signal (14) into sub-frames (SF1, SF2, ...), and
> - for at least one sub-frame (SFi):
> - determining at least one said parameter value (Psfi) yielded by said time-evolving signal (14) over at least a part of that sub-frame (SFi), and
> - expressing said parameter value as a component of a vector (S) along a dimension thereof specifically allocated to that sub-frame (SFi),
>
> the resultant vector forming the signature (S) of said gesture (G).

Independent Claim 27, while directed to an alternative embodiment, recites substantially similar features as those recited in independent Claim 1. Accordingly, the arguments presented below are applicable to each of independent Claims 1 and 27.

As discussed at p. 2, lines 22-28 of the specification, the present invention allows for fast and accurate gesture recognition, which can be used for less pronounced gestures, such as hand movements. Specifically, breaking an EMG signal into various time-divided sub-frames (see Fig. 2) and determining a parameter related to each of these sub-frames, allows a gesture to be detected in a short period of time (e.g., over only four sub-frames, as described at Fig. 5, and the corresponding text).

In addressing independent Claim 1, the Official Action cites Jorgensen as disclosing all the features recited in this claim except for the steps of "time-dividing the time-evolving signal," "determining at least one said parameter value," and "expressing said parameter value." The Official Action cites Kiraly as disclosing these claimed features and states that it would have been obvious at the time of the invention to combine the cited references to arrive at Applicant's claims. Applicants respectfully traverse this rejection, as there is insufficient motivation to combine the cited references.

Jorgensen describes a method and system for recognizing and characterizing signals associated with a gesture of a person, and using the recognized gestures to enter data and/or commands into an electrical and/or mechanical instrument.[1] More specifically, Jorgensen describes a method for obtaining a gesture signature in free space by dividing a detected EMG signal into sub-frames and determining a parameter value over that sub-frame (e.g., average magnitude OTA for instance) for each channel.

Kiraly, the secondary reference, describes a method and system for gesture category recognition and training using a feature vector. Specifically, Kiraly describes receiving input data from a two dimensional (2D) cursor device, and using the data to recognize a predetermined gesture to identify a set of user commands.

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[1] Jorgensen, Abstract.

The outstanding Office Action states that the proposed modification would have been obvious "because of the advantage of further allowing the use of cursor movement pattern as gesture for certain commands.[2] The record, however, fails to provide the required evidence of a motivation for a person of ordinary skill in the art to perform such modification. While Kiraly may provide a reason for using gesture recognition in a 2D mouse or track-ball input, Kiraly fails to suggest why a person of ordinary skill in the art would be motivated to incorporate such a feature in a system for recognizing and characterizing bioelectrical potential signals, as described by Jorgensen. In particular, Kiraly uses a signal representative of a 2D motion, since only planar motions are detected in his system, to recognize various gestures input by a user. Kiraly, however, does not suggest that the method of recognizing 2D motions would work in a system for recognizing and characterizing bioelectric potential associated with a users 3D muscular activity, much less "allow the use of a cursor movement as a gesture representing certain commands," as asserted in the Official Action.

In addition, Jorgensen is not concerned with recognizing 2D commands input by a mouse, track ball, or other similar input device, whatsoever. Instead, Jorgensen is concerned with using a plurality of sensors placed on a user's body to recognize a user's muscular movement and generating bioelectric potential signals based on this movement (or series of movements). Jorgensen states that its structure already achieves the goal of monitoring and characterizing bioelectric potentials in muscles and related body components that arise from gestures.[3] Jorgensen does not suggest that further improvement is desired, nor that another feature should be added to further improve the recognition and categorization of the 3D bioelectric signals generated by a user. In particular, Jorgensen does not suggest to add the ability to detect a 2D "cursor movement pattern," such as those disclosed in Kiraly.

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[2] Office Action at p 5.

[3] Jorgensen, col. 1, lines 6-9.

Jorgensen and Kiraly, therefore, do not provide the motivation to perform the proposed modification of Jorgensen. In other words, an attempt to bring in the isolated teaching of Kiraly's 2D cursor detection method into Jorgensen's system would amount to improperly picking and choosing features from different references without regard to the teachings of the references as a whole. While the required evidence of motivation to combine need not come from the applied references themselves, the evidence must come from *somewhere* within the record. In this case, the record fails to support the proposed modification of Jorgensen.

Furthermore, it is not clear from the record how Kiraly's method of identifying commands based on detected 2D cursor inputs could be incorporated into Jorgensen's system. Under such a modification, the 2D detection system of Kiraly would have to be substantially redesigned in order to process bioelectric potential signals representing 3D muscular movements detected at a plurality of sensors attached to a user. As noted above, Kiraly is directed to simply interpreting 2D patterns generated by a customary input device (e.g., mouse, track ball, etc.). Thus, Kiraly's system would have to be completely redesigned in order to process 3D signals, which are bioelectric potential signals, and which are generated from a plurality of sensors located on a user's body. There is no evidence that a person of ordinary skill in the art would be motivated to perform such changes and redesign.

In rejecting a claim under 35 U.S.C. § 103(a), the USPTO must support its rejection by "substantial evidence" within the record, and by "clear and particular" evidence of a suggestion, teaching, or motivation to combine the teachings of different references. As discussed above, there is no substantial evidence, nor clear and particular evidence, within the record of motivation for modifying Jorgensen's system by incorporating features of Kiraly's system Without such motivation and absent improper hindsight reconstruction,[4] a person of ordinary skill in the art would not be motivated to perform the proposed modification, and Claims 1-3, 5, 11-27 and 29-32 are believed to be non-obvious and patentable over the applied references.

Accordingly, Applicants respectfully request that the rejection of independent Claims 1 and 27 (and the claims that depend therefrom) under 35 U.S.C. 103 be withdrawn.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1-27 and 29-32, is definite and patentably distinguishing over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested

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[4] See MPEP 2141, stating, as one of the tenets of patent law applying to 35 USC 103, that "[t]he references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention."